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EXAMINER	
GREENE, JASON M	
ART UNIT	**PAPER NUMBER**
1724	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/871,156	Applicant(s) BENSON ET AL.
	Examiner Jason M. Greene	Art Unit 1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 November 2002 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-35 is/are rejected.

7)☒ Claim(s) 21 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 13 November 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10,13 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 13 November 2002. These drawings are acceptable.

Response to Amendment

Claim Objections

2. Claim 21 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 21 recites the limitation "wherein the particulate comprises a solid particulate, a liquid particulate or mixtures thereof". Since this limitation is also recited in claim 11, claim 21 does not further limit the subject matter of claim 11. It is noted that Applicants stated that claim 21 had been cancelled in the reply filed on 13 November 2002. However, claim 21 has not been cancelled and is still pending.

Response to Arguments

3. Applicant's arguments with respect to claims 1-35 have been considered but are moot in view of the new ground(s) of rejection.

4. Applicant's arguments filed 13 November 2002 have been fully considered but they are not persuasive.

With regard to Applicants' argument that the filter as claimed is limited to a filter having only one substrate layer, the Examiner contends that the claim language includes a structure having move than one substrate layer. In particular, claim 1 recites the limitation "A fine filter media comprising a single layer of a filter substrate", claim 11 recites "said filter structure comprising a fine fiber filter media and a single layer of a filter substrate, and claim 25 recites the limitation "a filter structure comprising one layer of filter substrate". Since all of the limitations include the open-ended transitional phrase comprising, the claimed structures are seen as being capable of including additional elements, such as additional substrate layers. Therefore, the stacked filter arrangement of Kahlbaugh et al. '399 is seen as reading on the claimed limitations.

With regard to Applicants' argument that the substrate layer of Kahlbaugh et al. does not possess the claimed filtration properties, the Examiner notes that Kahlbaugh et al. '399 explicitly discloses the substrate layer having a permeability of 150 m/min (2.5 m/sec) and an efficiency of 10 percent in col. 14, line 63 to col. 15, line 6.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahlbaugh et al. '399 in view of Teague et al.

With regard to claim 1, Kahlbaugh et al. '399 discloses a fine fiber filter media comprising a single layer of filter substrate (14), the substrate having a first surface and a second surface, the substrate having a permeability of 150 m/min (2.5 m/sec) and an efficiency of 10 percent, the first surface and the second surface each comprising a layer (15,19) of fine fiber having a diameter of 0.1 microns, the layer of fine fiber having a thickness of 2 microns, the fine fiber formed in an amount effective to obtain an overall efficiency under ASTM 1215-89 with monodispersed 0.78 micron polystyrene latex particles at 20 ft/min velocity of between 50 and 90 percent in any one layer in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 16, lines 34-55, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 90 percent or the fine fiber layer having a pore size of about 0.0001 to 5 microns.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Teague et al. discloses a filter media including a layer of fine fiber having a pore size of 1 micron in col. 5, lines 27-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pore size of Teague et al. into the fine filter layer of Kahlbaugh et al. '399 to provide a fine fiber layer having a desired efficiency and permeability.

Furthermore, Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the substrate having a permeability of about 0.03 to 15 m/sec and an efficiency greater than 5 percent, the fine fiber having a diameter of about 0.001 to 0.5

microns, the layer having a thickness of less than 5 microns, and the efficiency of each layer being less than 90 percent, these limitations are anticipated.

With regard to claim 2, Kahlbaugh et al. '399 discloses the efficiency of the fine fiber layer on the first surface being different than the efficiency of the fine fiber layer on the second surface in col. 6, lines 4-16 and col. 24, lines 38-56.

With regard to claim 3, Kahlbaugh et al. '399 discloses the efficiency of the fine fiber layer on a downstream surface being greater than the efficiency of the fine filter layer on an upstream surface in col. 24, lines 38-56.

With regard to claim 4, Kahlbaugh et al. '399 discloses the sheet-like substrate having a thickness of 0.01 inches (0.254 mm), the first surface and the second surface each comprising a layer of fine fiber having a diameter of 0.1 microns, the layer having a thickness of 2 microns, and the fine fiber being polycarbonate in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 15, lines 6-18, col. 16, lines 34-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the fine fiber being selected such that after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F and a relative humidity of 100 percent retains greater than 50 percent of the fiber unchanged for filtration purposes.

However, both Applicants and Kahlbaugh et al '399 disclose forming the fine fiber layer of the same materials. Specifically, Applicants teach forming the fine fiber layer from polypropylene, polyvinyl chloride (PVC), cellulose ester, polyacrylonitrile, polyamides, polystyrene, polyvinylidene fluoride, polyvinylidene chloride, or nylon in page 15, line 30 to page 18, line 19. Kahlbaugh et al. '399 teaches forming the fine fibers from identical materials in page 16, lines 53-64. Since Applicants and Kahlbaugh et al '399 both teach the fine fiber layer being formed from the same material, the fine fibers of Kahlbaugh et al. '399 would inherently have the same heat and humidity resistance properties as the fine fibers of the present invention.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the substrate having a thickness of about 0.1 to 3 millimeters, the fine fiber having a diameter of about 0.01 to 0.3 microns, and the fine fiber layer having a thickness of less than 3 microns, these limitations are anticipated.

With regard to claim 5, Kahlbaugh et al. '399 discloses the fine fiber being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 90 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being less than 85 percent and the efficiency of the substrate being about 5 percent to about 80 percent, these limitations are anticipated.

With regard to claims 6 and 8, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 65 percent or the substrate having an efficiency of about 20 percent to about 80 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the

time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the efficiency of the substrate to increase the efficiency of the filter media to reduce the amount of particulate matter passing through the filter media.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being less than 80 percent and about 40 percent to 80 percent, these limitations are anticipated.

With regard to claim 7, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in, col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 65 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the

time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being 40 percent to 85 percent and the efficiency of the substrate being about 5 percent to about 80 percent, these limitations are anticipated.

With regard to claim 9, Kahlbaugh et al. '399 discloses the fine fiber layer being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the fine fiber being polycarbonate in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 18, col. 16, lines 56-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 80 percent or the fine fiber being selected such that after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F and a relative humidity of 100 percent retains greater than 50 percent of the fiber unchanged for filtration purposes.

Since Kahlbaugh et al. teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the

invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be $1 - (1-0.7)*(1-0.7) = 0.91 = 91$ percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges the efficiency of each fine fiber layer being less than 75 percent, this limitation is anticipated.

With regard to claim 10, Kahlbaugh et al. '399 discloses the filter media having an efficiency greater than the efficiency of a single sided media in Fig. 7, col. 14, lines 1-14, col. 24, lines 38-56, and col. 27, lines 36-55. The term single sided media has been taken to mean a filter media having a fine fiber layer on only one surface of a substrate.

Kahlbaugh et al '399 does not disclose the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns, wherein the filter media has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H_2O at test conditions of 10 ft/min.

Kahlbaugh et al. '399 teaches the filter media having a lifetime between 2 and 5 inches H_2O at test conditions of 10 ft/min in col. 33, lines 54-57.

Since the prior art range is seen as overlapping the disclosed range of about 3 inches H_2O, a prima facie case of obviousness exists which must be overcome through a showing of unobvious or unexpected results.

Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

7. Claims 11-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahlbaugh et al. '399 in view of Teague et al.

With regard to claims 11 and 21, Kahlbaugh et al. '399 discloses a method of removing a particulate from an air borne stream, the particulate comprising a liquid particulate, a solid particulate, or mixtures thereof, the method comprising placing a filter structure in an air stream and directing the air stream through the filter structure while monitoring the useful life of the filter structure, said filter structure comprising a fine fiber filter media and single layer of a filter substrate (14), the substrate having a permeability of 150 m/min (2.5 m/s) and an efficiency of 10 percent, the substrate having a first surface and a second surface, the first surface and the second surface each comprising a layer (15,19) of fine fiber having a diameter of 0.1 microns, the layer of fine fiber having a thickness of 2 microns, the fine fiber formed in an amount effective to obtain an overall efficiency under ASTM 1215-89 with monodispersed 0.78 micron polystyrene latex particles at 20 ft/min velocity of between 50 and 90 percent in any one layer in Figs. 7 and 25, col. 1, lines 5-33, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col.

12, lines 38-47, col. 14, lines 1-14, col. 16, lines 34-55, col. 22, line 55 to col. 23, line 32, col. 27, lines 36-55, and col. 33, lines 35-57.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 90 percent or the fine fiber layer having a pore size of about 0.0001 to 5 microns.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Teague et al. discloses a filter media including a layer of fine fiber having a pore size of 1 micron in col. 5, lines 27-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pore size of Teague et al. into the fine filter layer of Kahlbaugh et al. '399 to provide a fine fiber layer having a desired efficiency and permeability.

Furthermore, Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the substrate having a permeability of about 0.03 to 15 m/sec and an efficiency greater than 5 percent, the fine fiber having a diameter of about 0.001 to 0.5 microns, the layer having a thickness of less than 5 microns, and the efficiency of each layer being less than 90 percent, these limitations are anticipated.

With regard to claim 12, Kahlbaugh et al. '399 discloses the efficiency of the fine fiber layer on the first surface being different than the efficiency of the fine fiber layer on the second surface in col. 6, lines 4-16 and col. 24, lines 38-56.

With regard to claim 13, Kahlbaugh et al. '399 discloses the efficiency of the fine fiber layer on a downstream surface being greater than the efficiency of the fine filter layer on an upstream surface in col. 24, lines 38-56.

With regard to claim 14, Kahlbaugh et al. '399 discloses the sheet-like substrate having a thickness of 0.01 inches (0.254 mm), the first surface and the second surface each comprising a layer of fine fiber having a diameter of 0.1 microns, the layer having a thickness of 2 microns, and the fine fiber being polycarbonate in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 15,

lines 6-18, col. 16, lines 34-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the fine fiber being selected such that after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F and a relative humidity of 100 percent retains greater than 50 percent of the fiber unchanged for filtration purposes.

However, both Applicants and Kahlbaugh et al '399 disclose forming the fine fiber layer of the same materials. Specifically, Applicants teach forming the fine fiber layer from polypropylene, polyvinyl chloride (PVC), cellulose ester, polyacrylonitrile, polyamides, polystyrene, polyvinylidene fluoride, polyvinylidene chloride, or nylon in page 15, line 30 to page 18, line 19. Kahlbaugh et al. '399 teaches forming the fine fibers from identical materials in page 16, lines 53-64. Since Applicants and Kahlbaugh et al '399 both teach the fine fiber layer being formed from the same material, the fine fibers of Kahlbaugh et al. '399 would inherently have the same heat and humidity resistance properties as the fine fibers of the present invention.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the substrate having a thickness of about 0.1 to 3 millimeters, the fine fiber having a diameter of about 0.01 to 0.3 microns, and the fine fiber layer having a thickness of less than 3 microns, these limitations are anticipated.

With regard to claim 15, Kahlbaugh et al. '399 discloses the fine fiber being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and

90 percent and the substrate having an efficiency of 10 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 90 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being less than 85 percent and the efficiency of the substrate being about 5 percent to about 80 percent, these limitations are anticipated.

With regard to claims 16 and 18, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 65 percent or the substrate having an efficiency of about 20 percent to about 80 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the efficiency of the substrate to increase the efficiency of the filter media to reduce the amount of particulate matter passing through the filter media.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being less than 80 percent and about 40 percent to 80 percent, these limitations are anticipated.

With regard to claim 17, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in, col. 4, line 12 to col. 5, line 23,

col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 65 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being 40 percent to 85 percent and the efficiency of the substrate being about 5 percent to about 80 percent, these limitations are anticipated.

With regard to claim 19, Kahlbaugh et al. '399 discloses the fine fiber layer being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the fine fiber being polycarbonate in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 18, col. 16, lines 56-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 80 percent.

Since Kahlbaugh et al. teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7) = 0.91 = 91 percent.

Since the prior art is seen as disclosing a specific example lying within the claimed range of the efficiency of each fine fiber layer being less than 75 percent, this limitation is anticipated.

With regard to claim 20, Kahlbaugh et al. '399 discloses the filter media having an efficiency greater than the efficiency of a single sided media in Fig. 7, col. 14, lines 1-14, col. 24, lines 38-56, and col. 27, lines 36-55. The term single sided media has been taken to mean a filter media having a fine fiber layer on only one surface of a substrate.

Kahlbaugh et al '399 does not disclose the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns, wherein the filter media has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H_2O at test conditions of 10 ft/min.

Kahlbaugh et al. '399 teaches the filter media having a lifetime between 2 and 5 inches H_2O at test conditions of 10 ft/min in col. 33, lines 54-57.

Since the prior art range is seen as overlapping the disclosed range of about 3 inches H_2O, a prima facie case of obviousness exists which must be overcome through a showing of unobvious or unexpected results.

Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

With regard to claim 22, Kahlbaugh et al. '399 discloses the particulate comprising residual components of combustion in col. 1, lines 28-33.

With regard to claim 23, Kahlbaugh et al. '399 discloses the particulate comprising a fatty oil in col. 32, lines 16-19.

With regard to claim 24, Kahlbaugh et al. '399 discloses the particulate comprising soot and grit in col. 1, lines 14-33. The soot is seen as being the exhaust from an engine, such as a diesel engine and the grit is seen as being particulate matter in the intake air stream of an engine.

8. Claims 25- 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahlbaugh et al. '399 in view of Teague et al.

With regard to claim 25, Kahlbaugh et al. '399 discloses a filter structure comprising one layer of filter substrate (14,18,21) and three or more layers of fine fiber, the substrate layer having a first surface and a second surface, the substrate layer having a permeability of 150 m/min (2.5 m/sec) and an efficiency of 10 percent, the surfaces comprising three or more layers of the fine fiber on the substrate, each fine fiber layer comprising fine fiber having a diameter of 0.1 microns, the dine fiber layer having a thickness of 2 microns, the fine fiber formed in an amount effective to obtain an overall efficiency under ASTM 1215-89 with monodispersed 0.78 micron polystyrene latex particles at 20 ft/min velocity of between 50 and 90 percent in any one layer in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 16, lines 34-55, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55. Kahlbaugh et al. '399 discloses a filter being formed by applying a fine fiber layer to a first and second side of a substrate in col. 27, lines 38-45. Kahlbaugh et al. '399 further discloses the filter structure being formed by joining two of the filters together such that two fine fiber layers are adjacent one another on each side of the substrate in col. 27, lines 52-55. Therefore, the filter structure is seen as comprising a substrate having 4 layers (2 on each side) of fine fibers on the surfaces of the substrate.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 90 percent or the fine fiber layer having a pore size of about 0.0001 to 5 microns.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7)*(1-0.7)*(1-0.7) = 0.9919 = 99.19 percent.

Teague et al. discloses a filter media including a layer of fine fiber having a pore size of 1 micron in col. 5, lines 27-60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pore size of Teague et al. into the fine filter layer of Kahlbaugh et al. '399 to provide a fine fiber layer having a desired efficiency and permeability.

Furthermore, Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the fine fiber having a diameter of about 0.001 to 0.5 microns, the layer having a thickness of less than 5 microns, and the efficiency of each layer being less than 90 percent, these limitations are anticipated.

With regard to claim 26, Kahlbaugh et al. '399 discloses the efficiency of a fine fiber layer on the first surface being different than the efficiency of a fine fiber layer on the second surface in col. 6, lines 4-16 and col. 24, lines 38-56.

With regard to claim 27, Kahlbaugh et al. '399 discloses the efficiency of a fine fiber layer on a downstream surface being greater than the efficiency of a fine filter layer on an upstream surface in col. 24, lines 38-56.

With regard to claim 28, Kahlbaugh et al. '399 discloses the sheet-like substrate having a thickness of 0.01 inches (0.254 mm), the first surface and the second surface each comprising a layer of fine fiber having a diameter of 0.1 microns, the layer having a thickness of 2 microns, and the fine fiber being polycarbonate in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 15, lines 6-18, col. 16, lines 34-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the fine fiber being selected such that after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F

and a relative humidity of 100 percent retains greater than 50 percent of the fiber unchanged for filtration purposes.

However, both Applicants and Kahlbaugh et al '399 disclose forming the fine fiber layer of the same materials. Specifically, Applicants teach forming the fine fiber layer from polypropylene, polyvinyl chloride (PVC), cellulose ester, polyacrylonitrile, polyamides, polystyrene, polyvinylidene fluoride, polyvinylidene chloride, or nylon in page 15, line 30 to page 18, line 19. Kahlbaugh et al. '399 teaches forming the fine fibers from identical materials in page 16, lines 53-64. Since Applicants and Kahlbaugh et al '399 both teach the fine fiber layer being formed from the same material, the fine fibers of Kahlbaugh et al. '399 would inherently have the same heat and humidity resistance properties as the fine fibers of the present invention.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the substrate having a thickness of about 0.1 to 3 millimeters, the fine fiber having a diameter of about 0.01 to 0.3 microns, and the fine fiber layer having a thickness of less than 3 microns, these limitations are anticipated.

With regard to claim 29, Kahlbaugh et al. '399 discloses the sheet-like substrate having a thickness of 0.03 inches (0.762 mm) in col. 15, lines 6-28.

Since the prior art is seen as disclosing a specific example lying within the claimed range of about 0.3 to 1 millimeter, this limitation is anticipated.

With regard to claims 30 and 31, Kahlbaugh et al. '399 discloses the fine fiber being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of the layers of fine fibers being greater than 85 or 90 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7)(1-0.7)*(1-.07) = 0.9919 = 99.19 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being less than 80 and 85 percent, these limitations are anticipated.

With regard to claim 32, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in, col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of the layers of fine fibers being greater than 65 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7)*(1-0.7)*(1-0.7)= 0.9919 = 99.19 percent.

Since the prior art is seen as disclosing specific examples lying within the claimed ranges of the efficiency of each fine fiber layer being 40 percent to 85 percent and the efficiency of the substrate being about 5 percent to about 80 percent, these limitations are anticipated.

With regard to claim 33, Kahlbaugh et al. '399 discloses the fine fiber formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the substrate having an efficiency of 10 percent in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 6, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the combined efficiency of the layers of fine fibers being greater than 65 percent or the substrate having an efficiency of about 20 percent to about 80 percent.

Since Kahlbaugh et al. '399 teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7)*(1-0.7)*(1-0.7) = 0.9911 = 99.19 percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the efficiency of the substrate to increase the efficiency of the filter media to reduce the amount of particulate matter passing through the filter media.

Since the prior art is seen as disclosing a specific example lying within the claimed range of the efficiency of each fine fiber layer being about 40 percent to 80 percent, this limitation is anticipated.

With regard to claim 34, Kahlbaugh et al. '399 discloses the fine fiber layer being formed in an amount effective, in each layer, to obtain an efficiency of between 50 and 90 percent and the fine fiber being polycarbonate in col. 4, line 12 to col. 5, line 23, col. 14, line 60 to col. 15, line 18, col. 16, lines 56-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. does not explicitly disclose the combined efficiency of both layers of fine fibers being greater than 80 percent.

Since Kahlbaugh et al. teaches the efficiency in any one layer being between 50 and 90 percent in col. 4, lines 12-61, one of ordinary skill in the art at the time the invention was made would have recognized that each layer could have been selected to have an efficiency of 70 percent to provide a filter media for a particular application. Using the equation provided by Kahlbaugh et al. '399 in col. 23, lines 26-28, the efficiency of two layers each having an efficiency of 70 percent can be calculated to be 1 - (1-0.7)*(1-0.7)*(1-0.7)*(1-0.7) = 0.9919 = 99.19 percent.

Since the prior art is seen as disclosing a specific example lying within the claimed range of the efficiency of each fine fiber layer being less than 75 percent, this limitation is anticipated.

With regard to claim 35, Kahlbaugh et al. '399 discloses the filter media having an efficiency greater than the efficiency of a single sided media in Fig. 7, col. 14, lines 1-14, col. 24, lines 38-56, and col. 27, lines 36-55. The term single sided media has been taken to mean a filter media having a fine fiber layer on only one surface of a substrate.

Kahlbaugh et al '399 does not disclose the fine fiber forming an interlocking mesh of fiber having on the average a pore size between fibers in the web of less than about 3 microns, wherein the filter media has a lifetime, defined as an increase in pressure drop over the filter of about 3 inches H_2O at test conditions of 10 ft/min.

Kahlbaugh et al. '399 teaches the filter media having a lifetime between 2 and 5 inches H_2O at test conditions of 10 ft/min in col. 33, lines 54-57.

Since the prior art range is seen as overlapping the disclosed range of about 3 inches H_2O, a prima facie case of obviousness exists which must be overcome through a showing of unobvious or unexpected results.

Kahlbaugh et al. '399 teaches adjusting the average pore size between adjacent fibers in the web to adjust the efficiency of the layer in page 32, lines 9-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the average pore size between fibers in the web to below about 3 microns to provide a layer having a desired efficiency for a desired application.

9. Claims 4, 14, and 28 are rejected under 35 U.S.C. 103 as being unpatentable over Kahlbaugh et al. '399 and Teague et al. as applied to claims 1, 11, and 25 above, and further in view of a public use and sale of the invention.

Under 35 U.S.C. §102(b), "[a] person shall be entitled to a patent unless ...the invention was in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States ...." 35 U.S.C. §102(b) (2000). Whether a patent is invalid for a public use or sale is a question of law based on underlying facts. A conclusion that a section 102(b) bar precludes a patent application from issuing must be based on substantial evidence. Section 102(b) may bar patentability by anticipation if the device used in public includes every limitation of the later claimed invention, or by obviousness if the differences between the claimed

invention and the device used would have been obvious to one of ordinary skill in the art.

Public use includes any use of [the claimed] invention by a person other than the inventor who is under no limitation, restriction or obligation of secrecy to the inventor. The public use bar serves the policies of the patent system, for it encourages prompt filing of patent applications after inventions have been completed and publicly used, and sets an outer limit to the term of exclusivity. Allied Colloids v. Am. Cyanamid Co., 64 F.3d 1570, 1574, 35 USPQ2d 1840, 1842 (Fed. Cir. 1995).

In this case, there is evidence that the invention was "completed" before the P19-1280 and P19-1281 filters were shipped to assignee's customers in the late spring of 1999, i.e., Solar Turbines, GE Elwood, GE Belle River, and the customers in Saudi Arabia and Santiago, Chile. Specifically, the production run noted at paragraph 10 of the Supplemental Crofoot declaration evidences that the filters were "completed" prior to their shipment to the customers.

Testing of a new product under development at the potential customer's site does not raise a public use bar as a matter of law. All of the circumstances must be considered, to ascertain whether on the entirety of the evidence it has been proved that the invention was publicly used.

The law recognizes that an inventor may test his invention in public without incurring the public use bar. Experimental use negates public use; when proved, it may show that particular acts, even if apparently public in a colloquial sense, do not constitute a public use within the meaning of section 102. TP Labs., Inc. v. Prof'l Positioners, Inc., 724 F.2d 965, 220 USPQ 577 (Fed. Cir. 1984)). "The use of an invention by the inventor himself, or of any other person under his direction, by way of experiment, and in order to bring the invention to perfection, has never been regarded as such a use." City of Elizabeth v. Am. Nicholson Pavement Co., 97 U.S. 126, 134 (1877). In this case, there is no evidence that the various customers to whom the filters were shipped in the spring of 1999 were acting under the direction of the inventors. They were not even aware that a so-called experiment was underway. See the Supplemental Crofoot Declaration at paragraph 17. There is no evidence of any oral or written confidentiality agreement between assignee and each of GE Belle River, GE Elwood. Solar Turbines, or the Saudi and Chilean customers.

The totality of the circumstances are reviewed when evaluating whether there has been a public use within the meaning of section 102(b). The totality of the circumstances is considered in conjunction with the policies underlying the public use bar. The circumstances may include: the nature of the activity that occurred in public; the public access to and knowledge of the public use; whether there was any confidentiality obligation imposed on persons who observed the use; whether persons other than the inventor performed the testing; the number of tests; the length of the test

period in relation to tests of similar devices; and whether the inventor received payment for the testing. See Allied Colloids, 64 F.3d at 1574, 35 USPQ2d at 1842; Baker Oil Tools, Inc. v. Geo Vann, Inc., 828 F.2d 1558, 1564, 4 USPQ2d 1210, 1214 (Fed. Cir. 1987); In re Brigance, 792 F.2d 1103, 1107-08, 229 USPQ 988, 991 (Fed. Cir. 1986); Hycor Corp. v. Schlueter Co., 740 F.2d 1529, 1535, 222 USPQ 553, 557 (Fed. Cir. 1984); TP Labs., Inc., 724 F.2d at 971-72, 220 USPQ at 582. There may be additional factors in a particular case relevant to the public nature of the use or any asserted experimental aspect.

In this case, the nature of the activity that occurred in public appears to be no different that the public use to which the prior art filters were put: Filtering of air admitted to turbines. There is no evidence that any of the customers believed they were under a confidentiality obligation imposed on the customers who observed the various uses. There is no evidence applicants made any discernable effort to inform the 1999 customers of any requirement of confidentiality, or otherwise indicate to them that they would owe them a duty of confidentiality. As noted above, the customers did not even know that a so-called experiment was underway. In this case, persons other than the inventors performed the testing. Finally, in this case the inventor received payment for the testing. All of these factors point to an ordinary commercial use rather than to an experimental use.

To establish that an otherwise public use does not run afoul of section 102(b), it must be shown that the activity was substantially for purposes of experiment. Applicants in their Crofoot Declaration and Supplemental Declaration presented no objective evidence to support experimental use. The experimental use negation is unavailable to a patentee when the evidence presented does not establish that he was conducting a bona fide experiment. TP Labs., Inc., 724 F.2d at 969, 220 USPQ at 580. Furthermore, Applicants presented no objective evidence that they maintained any records of testing the filters. This failure weighs against them. Allied Colloids, 64 F.3d at 1576, 35 USPQ2d at 1844; TP Labs., Inc., 724 F.2d at 972-73, 220 USPQ at 583) (recognizing that whether records were kept of progress may indicate that an inventor was testing the device, not the market).

Preparation of detailed records of the so-called "experimental" uses of the invention at the customer's plants is highly relevant for the keeping of detailed test records is a routine indicium of the experimental mode. As in TP Labs., such facts "indicate the inventor was testing the device, not the market." 724 F.2d at 973, 220 USPQ at 583. In this case, there is no evidence whatsoever of any records of the performance of the filters in the customers' plants.

Applicants do not even argue that at all relevant times they took affirmative steps to maintain control of the invention. Here, Crofoot contends that applicants were alerted to the return of some filters, but there is no evidence that applicants required the

customers to return the spent filters for forensic examination of their condition, nor did applicants indicate that the customers were required or even requested to provide feedback on the performance of the "new" filters. While there is some evidence that the customers closely monitored the performance of the filters, there was no indication that applicants inquired of those results, or required that data of their customers. As in Netscape Communications Corp. v. Konrad, 63 USPQ2d 1580 (Fed. Cir. 2002), applicants sold the filters "and let people try it out." There is no indication that applicants ever monitored the operating parameters of the turbine systems in which the new filters were used.

The law recognizes an inventor's need to test the invention, to ascertain whether the work is complete or further changes should be made, and to show that the invention will work for its intended purpose. . . . [S]uch testing and development may encompass or even require disclosure to the public, without barring the inventor's access to the patent system. Furthermore, if testing had to be run in customer's plant, even subsequent commercial success does not convert the test activity into an invalidating public use. The dispositive consideration is whether ***the inventor*** was in fact testing the invention. It is not necessary that the machine should be put up and used only in the inventor's own shop or premises. He may have it put up and used in the premises of another, and the use may inure to the benefit of the owner of the establishment. But for such a use by a customer to qualify as an "experimental use," the use must be under the surveillance of the inventor, and for the purpose of enabling him to test the product,

and to ascertain whether it will answer the purpose intended, and make such alterations and improvements as experience demonstrates to be necessary. In this case, there is no evidence that the use was under the surveillance of the inventor. In this case, there is no evidence that the use by the customers was for the purpose of enabling the inventors to test the product. In this case, there is no evidence that the various uses were designed to answer whether the product would satisfy the purpose intended.

Declarant Crofoot stated the problem in the prior art was deterioration of the fine fibers made of the "old polymer" under combined conditions of high temperature (>25 °C) and high relative humidity (>70% relative humidity). However the locations selected to conduct the testing do not satisfy this requirement. Namely, the locations selected to conduct the testing are not hot and humid. Since the shipments were made in May, it can be assumed that the filters were installed during the months of June through August, as one would expect the filters to be installed within three months of shipment. While Saudi Arabia is hot during these months, it is not humid, as evidenced by the fact that a vast majority of Saudi Arabia is desert. Similarly, Santiago, Chile is not hot in the months of June through August as this is the winter season in the Southern Hemisphere.

Applicants' failure to monitor the use of the new filters and failure to impose confidentiality agreements on those that used it was enough to place the claimed features of the patent applications in the public's possession.

The on-sale bar applies when the invention is the subject of a commercial offer for sale, and is ready for patenting before the critical date. Pfaff v. Wells Electronics, Inc., 525 U.S. 55, 48 USPQ2d 1641 (1998). The ready for patenting condition "may be satisfied in at least two ways: by proof of reduction to practice before the critical date; or by proof that prior to the critical date the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention." Id. at 67-68. In this case, there is evidence that the claimed invention, or an obvious variation thereof, was reduced to practice because the new filters including the new polymer were manufactured and shipped to customers in the spring of 1999.

When the asserted basis of rejection is the on-sale bar, the examiner should determine whether the subject of the barring activity met each of the limitations of the claim. The various shipments of the filters in the spring of 1999 made in response to the various purchase orders from the various customers placed with the assignee of the invention clearly evidence "sales" of the filters made with the "new polymer" before the critical date of 05 September 1999. These sales were not incidental to an otherwise experimental use, so they evidence that the filters were "on-sale" within the meaning of §102(b).

The purchase orders submitted by the customers, i.e., Solar Turbines, GE Belle River, GE Elwood, the Saudi Arabia facility, and the Santiago, Chile facility were offers

to buy the P19-1280 and P19-1281 filters. The purchase orders presumably contained sufficiently definite terms to create an enforceable contract upon acceptance under the UCC. It is unclear if they identified the requested product by specifically referring to the P19-1280 and P19-1281 product numbers. Be that as it may, the fact is that the assignees shipped the P19-1280 and P19-1281 products including the "new polymer" in response to these purchase orders. Filling of the orders with shipped product evidences a sale.

The absence of payment supports the inference that the tests were for the benefit of the applicant, and thus contravenes the inference of public use for or by the potential customer. However, unlike the Applied Colloids case, Assignee received payment from the customers for the filters shipped.

10. Kahlbaugh et al. '399 discloses the sheet-like substrate having a thickness of 0.01 inches (0.254 mm), the first surface and the second surface each comprising a layer of fine fiber having a diameter of 0.1 microns, the layer having a thickness of 2 microns, and the fine fiber being polycarbonate in Fig. 7, col. 3, lines 27-64, col. 4, line 12 to col. 5, line 23, col. 12, lines 38-47, col. 14, lines 1-14, col. 15, lines 6-18, col. 16, lines 34-64, col. 22, line 55 to col. 23, line 32, and col. 27, lines 36-55.

Kahlbaugh et al. '399 does not explicitly disclose the fine fiber being selected such that after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F

and a relative humidity of 100 percent retains greater than 50 percent of the fiber unchanged for filtration purposes.

The P19-1280 and P19-1281 filters, as in public use and offered for sell prior to the critical date of 05 September 1999, comprise a fine fiber layer and a non-woven fabric substrate layer, wherein the fine fiber layer is formed of an additive free nylon blend of about 70 weight percent alkoxy alkyl modified nylon 66 and 30 weight percent of a blend consisting of 50 weight percent nylon 6, 25 weight percent nylon 66, and 25 weight percent nylon 6.10. See Crofoot Declaration at paragraphs 5 and 13.

While the fine fiber layers of the P19-1280 and P19-1281 filters are not explicitly disclosed as retaining greater than 50 percent of the fiber unchanged for filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F and a relative humidity of 100 percent, the fine fiber material would have inherently possessed these heat and humidity resistance properties. As disclosed in the Supplemental Declaration at paragraph 4, the fibers used to form the fine fiber layers were developed to solve the problem of deterioration of the prior art fine fiber layer under the conditions of high heat and high humidity. Since the fibers used to form the fine fiber layer were explicitly developed to provide heat and humidity resistance, they would have inherently retained greater than 50 percent of the fiber unchanged for filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 ^{0}F and a relative humidity of 100 percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the fine fiber layer material of the P19-1280 and

P19-1281 filters into the filter of Kahlbaugh et al. '399 and Teague et al. to provide a filter having a fine fiber layer capable of performing in hot and humid environments.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (703) 308-6240. The examiner can normally be reached on Tuesday - Friday (7:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Simmons can be reached on (703) 308-1972. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jason M. Greene
Examiner
Art Unit 1724

David A. Simmons
Supervisory Patent Examiner
Technology Center 1700

jmg
January 24, 2003